Homework Assignment for Week 08

1. Section 4.6: Problems 13, 23(b), 25, 26, 28, 29, 33.

2. Read and compare the difference between Intermediate Value Theorem and Mean Value Theorem.

3. Section 5.2: Problems 34, 36, 38, 39, 46.

4. (s5.2-extra1) Evaluate

$$\lim_{n \to \infty} \sum_{k=1}^{n} \frac{1}{n} \sqrt{1 - (\frac{k}{n})^2}$$

   Hint: What is the area of a circle? what does it have to do with this problem?

5. (s5.2-extra2) Use the binomial expansion for $(k+1)^{\ell}$ to show by induction that

$$\lim_{n \to \infty} \sum_{k=1}^{n} \frac{1}{n} (\frac{k}{n})^{\ell} = \frac{1}{\ell + 1}$$

   where ℓ is a positive ingteger.

   Hint: $(k+1)^{\ell+1} = k^{\ell+1} + (\ell+1)k^{\ell} + \cdots$.